HP StorageWorks

Multi-protocol Router XPath OS 7.4.1d

release notes

Description

These release notes contain information about installing, operating, and maintaining the HP StorageWorks Multi-protocol (MP) router running XPath OS 7.4.1d.

Supersedes history

This version supersedes XPath OS 7.4.1c released in December 2006.

Effective date

March 2007

Update recommendation

Routine

Product compatibility

Table 1 lists compatible HP MP Routers and transceivers.

Table 1 Supported MP Routers and transceivers

MP Routers	Part number
StorageWorks MP Router base (8-port)	A7437A
StorageWorks MP Router full (16-port)	A7438A
Multi-protocol Router upgrade license	A7439A
Transceivers[1]	**Part Number**
Short Wave (300m@2Gbps, 500m@1Gbps)	A7446B, A6515A
Long Wave (35 km, Fibre Channel port type only)	A6516A
Long Wave (10 km)	300836-B21

[1]A7446B, A6515A, and A6516A support all MP Router port types: Fibre Channel, GbE for FCIP and GbE for iSCSI.

MP Router GbE connectivity is equivalent to 1000Base-SX or 1000Base LX.

For GbE copper connectivity, refer to the Brocade Compatibility Matrix for supported copper SFPs.

For the MP Router configuration and scalability rules, see the *HP StorageWorks SAN design reference guide* at http://h18000.www1.hp.com/products/storageworks/san/documentation.html.

Accessing the latest firmware

To access XPath OS 7.4.1d firmware, configuration files and MIB files go to the following HP web site:

http://h18006.www1.hp.com/storage/saninfrastructure/index.html

Devices supported

Table 2 summarizes the B-Series Fibre Channel switch models and firmware versions that are supported with XPath OS 7.4.1d.

Table 2 XPath OS 7.4.1d supported B-Series switches and firmware

Versions	Brocade 4Gb SAN Switch for HP c-Class and p-Class Blade Systems	B-Series 1Gb/s switches	2/8, 2/8-EL, 2/16, 2/16-EL	2/8V, 2/16V, 2/16N, 2/32, 2/128	4/8, 4/16, 4/32, 4/64, 4/256	Fabric Manager[1]
HP recommended Versions	5.0.5c	2.6.2d	3.2.1b	5.2.0b, 5.1.1a	5.2.0b, 5.1.1a	5.2.0a

1 HP's optional Fabric Manager software is strongly recommended in all configurations utilizing the MP Router.

For the latest information on supported B-Series switches and firmware versions, see the HP SAN Infrastructure website:

http://h18006.www1.hp.com/storage/saninfrastructure/index.html

Operating systems

This product supports the following operating systems. For specific version information, contact an HP Storage representative.

- HP-UX
- HP OpenVMS
- HP Tru64 UNIX
- IBM AIX
- Microsoft™ Windows™
- Novell NetWare™
- Red Hat® Linux®
- SUSE™ Linux
- Sun Solaris

Language

English

Fixes

Table 3 lists critical or high level issues resolved in XPath OS 7.4.1d firmware.

Table 3 Resolved issues in XPath OS 7.4.1d firmware

Issue	Description
Name Server client (NSCL) APIs hang while querying for symbolic names.	When an F-port is connected remotely, the symbolic name for the port is unavailable.
Multi-protocol Router panic, core files are truncated.	Core files are created, but truncated due to a lack of file space. A new CLI command has been created. Use setcorepath to set a path to a file system large enough to save core files. This directory can be located on either the switch's internal file system or an external file system mounted via NFS.
Unable to configure IP addresses on GigE port.	Unable to configure 10.20.x.x IP address on GbE ports using WebTools on XPath OS 7.4.1a or 7.4.1b.
Multi-protocol Router panic and reboot.	On an MP Router running XPath OS 7.4.1a, iswitchd (the FCR daemon) might experience a segmentation fault.
Multi-protocol Router running XPath OS 7.4.1b, GbE ports have duplicate MAC addresses.	The `portshow` command output shows the same MAC address assigned to two GbE ports on the switch.
Unexplained Multi-protocol Router reboots.	With extremely high I/O loads on long distance E-Ports (LD mode), subsequently transmitted out via an EX-Port, may result in the Multi-protocol Router to panic and reboot.
The syslog loses information when a management daemon crashes.	The syslog misses the complete log history of the current boot when a daemon crashes.

Installation

This section describes HP MP Router installation issues.

Migration procedure

For instructions on migrating to XPath OS 7.4.1d from earlier versions of XPath OS, see the *HP StorageWorks XPath OS 7.4.x administrator guide*.

Initial MP Router setup rules

When an MP Router is powered on for the first time, by default all ports are disabled. You must explicitly set each MP Router port to the desired port type before making any cable connections. Refer to Table 4 and Table 5 for specific port information.

> 📝 **NOTE:**
> Since it is expected that the majority of installations will use the MP Router for Fibre Channel routing, EX_Port type will be the typical port setting.

Table 4 and Table 5 list MP Router port modes and port type functions.

Table 4 MP Router port modes

Mode	Port type
Fibre Channel	EX_Port or U_port (E_Port or F_Port)
GbE with FCIP or iSCSI	IP port

Table 5 MP Router port types functions

Port type	Function
EX_Port	Connecting one or more edge fabrics to an MP Router.
IP Port	Connecting to a GbE network when using FCIP tunneling or iSCSI bridging.
U_Port (E_Port)	Connecting two or more MP Routers together in a router backbone fabric.
U_Port (F_Port)	Connecting F_Port to the MP Router (iSCSI only)

IMPORTANT:

U_Port/E_Port connections are supported between two or more routers only for the purpose of creating a router backbone fabric. If an E_Port connection is made from an MP Router to an edge fabric, you must remove the edge fabric configuration and zone settings from the router as the edge fabric configurations and zone settings would propagate to the router when connected. You must use the EX_Port type when connecting edge fabrics to an MP Router.

Setting up and enabling the MP Router ports for the first time

To set and enable MP Router ports:

1. Stop all ports using the following CLI command:

   > PORTSTOP 0-15

   Where 0-15 represents all ports on the router.

   This step ensures that it is now safe to cable other routers and/or edge fabrics to the router until such time that the user is ready to restart the port to complete the configuration.

2. Define the desired port setting:

   > portcfgexport

   Where *n* is the port number for a port to be set as an EX_Port.

   > portcfgeport *n*

   Where is the port number for a port to be set as a E_Port.

   > portcfgfcip *n*

   Where *n* is the port number for a port to be set as a GbE FCIP port.

   > portcfgGbE *n* -p iSCSI

   Where n is the port number for a port to be set as a GbE iSCSI port

3. Connect the cable to the MP Router port.

4. Start the port with the command:

   > PORTSTART n

   Where *n* is the port you want to start.

> 📝 **NOTE:**
> If an E_Port connection is inadvertently created to the router from an edge fabric, disconnect the cable, stop the port on the router (as described above), and remove all configuration and zoning from the router (if necessary). If the connection was meant to be an EX_Port, then create it on the router, reconnect the cable, and restart the port.

Important information

This section describes important information and important notes for the XPath OS 7.4.1c release.

Important notes

Table 6 through Table 11 list issues you should be aware of when using XPath OS 7.4.1c and the HP StorageWorks MP Router.

Table 6 Fibre Channel routing services

Issue	Description
Unexpected LSAN Zone Update messages or unexpected physical device offline messages	These messages can occur during normal operation. However, if the MP Router reports numerous occurrences that cannot be correlated to actual initiated events, such as planned device reconfigurations or reboots, examine low-level port error counts using the `portstatsshow` command. Faulty cables and SFPs that cause interruptions in EX_Port connectivity might also cause unexpected fabric reconfigurations. In the event of unexpected fabric reconfigurations, ensure that there are no low-level errors occurring on ports and focus diagnostic efforts on cables and SFPs.
Zoning restrictions for LSAN zones and local fabric zones	Remote WWNs cannot be in both a Logical Storage Area Network (LSAN) zone and a local fabric zone of fabrics that they do not physically reside in. Putting them in both locations, may result in excessive boot times for host or servers in fabrics connected to the MP Router. If a remote node WWN is in an LSAN zone, then it cannot also be in a local non-LSAN zone in a fabric that it does not physically reside in. For example, if you have a host or storage device defined in a remote fabric zone and you wish to add either of these devices to an LSAN zone, you need to ensure that these devices are not listed in any local zones other than the physical fabric they reside in. Local WWNs are allowed in both an LSAN zone and the local zones of the fabric where they are physically located.
Fabric ID oversubscribed message	The port error `Fabric ID oversubscribed` displays if you configure multiple EX-port connections to the same fabric using different Fabric IDs. While the Fabric ID used for each fabric connected to the MP Router is unique, all EX-ports connected to the same fabric from the MP Router must use the same Fabric ID.
HBA configuration	In certain large routed fabrics with large numbers of EX_Ports (for example, ≥ 8) connected to each fabric (usually done for bandwidth for large numbers of shared initiators and targets across fabrics) and a large number of shared devices (for example, ≥ 800), set the `PLOGI timeout` value for 1 Gbps JNI FC HBAs to 3000 ms. This will allow time for the routed fabric to answer PLOGI requests.

Issue	Description
Meta-SAN traffic	In a non-routed SAN, if there are multiple E_Port links between two switches and fabric reconfigurations occur due to the loss of a single E_Port link, then traffic around the fabric is generally not interrupted (or is interrupted for a very short time: for example, less than one second).
	Due to a design decision in this release of the Router, traffic disruption for routed traffic always occurs for a short period (less than one second), even if EX_Port links remain available. The manager of a non-routed SAN will not expect this performance characteristic.
	During testing, applications have been shown to tolerate the traffic disruption in the routed fabric and to recover based on an application specific recovery timeline, which is typically longer than when the fabric again permits traffic to flow. However, the commonly used I/O test tool, Iometer, is known to panic or crash under certain circumstances of traffic disruption; this has been witnessed to occur in large routed fabric configurations.
Edge fabric switch booting and EX_Ports	Certain configuration values and versions of Fabric OS switches in edge fabrics might cause EX_Ports on the Router to be disabled when the switches are rebooted.
	Evidence of the unexpected disabled EX_Port can be seen in the Router's port display:
	# switchshow
	:
	7 id AN No_Light disabled EX_PORT
	(Last error: Failed to init in time)
	Workaround for switches running FOS 3.x /4.x:
	• Issue the diagdisablepost command on edge switches connected to Router EX_Ports.
	• Upgrade edge switches to Fabric OS 3.x/4.x.
	• Manually enable any disabled EX_Ports when the condition occurs.
Edge fabric segmentation	If an edge fabric in which multiple EX_Ports are linked to multiple edge switches segments into two or more fabrics, all EX_Ports connected to any of the *new* fabrics resulting from the segmentation will be disabled due to a fabric ID (FID) conflict error. If the edge fabric remerges into a single fabric, the EX_Ports that were disabled remain disabled until administratively enabled. This characteristic is by design, to prevent erroneous meta-SAN configurations from forming.
Fibre Channel test equipment	Fibre Channel test equipment must use a maximum frame size of 2048 bytes or less when used with the MP Router.
	Fibre Channel HBAs are not affected by this issue, because maximum frame size is typically negotiated during N_Port login (PLOGI).

Table 7 FCIP service

Issue	Description
Serverless backup applications and routed fabrics	With routed fabrics, serverless backup using SCSI Extended Copy (XCOPY) commands is not supported if the backup server and copy manager reside on different fabrics and the target descriptor(s) in the Extended Copy command contains port IDs (descriptor type codes E1h or E2h).
FCIP with Continuous Access EVA, XP, or HSG80 DRM (exchange-based trunking feature)	MP Router Fibre Channel over IP (FCIP) ports utilized for Continuous Access EVA, XP, or HSG80 DRM must have the exchange-based trunking feature disabled. Disabling exchange trunking across FCIP port processors can be accomplished using the following commands:
	portCfgFcip -m 2
	FCIP portcfgfcip [-m LOAD_BAL (1-exchange, 2-SID_DID, 3-none]
	The default is 1. Must be set to 2 or 3 for Continuous Access EVA, XP, or HSG80 DRM.

Issue	Description
Multiple FCIP Links not supported with Continuous Access EVA or HSG80 DRM	Support for multiple FCIP Links between locations was added in XPath 7.0.3b. This feature is supported with Continuous Access XP only.
FCIP with Continuous Access XP	All Continuous Access XP configurations using the MP Router require a minimum of 45 Mbps IP bandwidth.
FCIP and firewalls	The Multi-protocol Router uses XPP as the transport layer for FCIP transmission. When a firewall is in the path of the FCIP tunnel, the firewall must be configured to allow protocol type 206 in the IP header. The purpose of this protocol type is to establish a connection and enable the FCIP traffic that traverses the firewall.
FCIP link	The FCIP selective acknowledgement feature was added in a previous version of firmware. This feature improves FCIP performance in conditions with high latency and packet loss. To ensure this feature is available, verify that MP Routers on both sides of the link are using 7.4.0 version firmware. If one side of the link is running firmware that does not support this feature, the link will not be established and `switchShow` will display `incompatible firmware` for that VE_PORT.
Wide area network services and FCIP	Available Bandwidth Parameter. Previous releases of FCIP demonstrated performance degradation and intermittent ISL failure if the IP network's available bandwidth for the ISL was restricted to less than 400 Mbps. This release includes a new parameter for the `portCfgFcip` CLI command. The parameter is `-b i` where i is the available ISL bandwidth in Mbps, rounded down to the closest integer value. Due to the various link-encapsulation methods, header sizes, and so forth, it might be difficult to determine the exact available bandwidth for a particular link. HP recommends setting the bandwidth parameter to 96% of the advertised link bandwidth (for example, `-b 96` for a 100 Mbps link). Additional tuning of the bandwidth parameter might be necessary for optimal throughput. Jumbo Frame Support. Previous releases of FCIP segmented FCIP-encapsulated FC frames into two Ethernet frames if the encapsulated FC frame would exceed standard Ethernet maximum frame size. To improve ISL throughput and bandwidth efficiency for an FCIP ISL capable of supporting jumbo Ethernet frames, this release includes a new `portCfgFcip` CLI command. The parameter is -j n. The n is set to 1 to enable jumbo frame transmission and 2 to disable jumbo frame transmission. This option is disabled by default. **NOTE:** The system does not attempt to verify that the link can support jumbo frames (there is no path MTU discovery). If configured to enable jumbo frame support on a network that does not support jumbo Ethernet frames end-to-end, the link will fail if a 2KB FC frame is sent across the FCIP ISL.

Table 8 iSCSI Gateway service

Releasing the IP address for a GbE port	Releasing the IP address of a Multiprotocol Router Gigabit Ethernet port requires setting the IP address of the port to `0.0.0.0`. For example: `portcfgGbE 15 -i 0.0.0.0` Upon releasing the IP address, the address can be used by other ports.
iSCSI Gateway Service support	The MP Router provides iSCSI support allowing iSCSI Initiators to access Fibre Channel based storage subsystems. For the latest information on supported configurations limitations, see the *HP StorageWorks SAN design reference guide*: http://h18000.www1.hp.com/products/storageworks/san/documentation.html
iSCSI Multi-path	iSCSI configurations using the MP Router are not supported with multi-path software. Windows servers using an iSCSI initiator must not have multi-path software installed.
Microsoft iSCSI version	This release of XPath supports Microsoft iSCSI initiator 1.06.

Table 9 XPath OS Base Operating System and Fibre Channel Service

Issue	Description
The `configdownload` command does not restore the previously saved configuration.	When using the `configdownload` command to restore a previously saved configuration, translate (xlate) domains may not restore properly when the xlate domains were created manually. To resolve this: 1. Identify the xlate domains that were created previously. This information can be extracted from the configuration file that was uploaded earlier using the `configupload` command. **NOTE:** It is a good practice to keep a record of any xlate domains that were created manually, so they will be available when needed. This eliminates the need to search through the configuration file. 2. Use the `fcrxlateconfig` command to manually recreate the xlate domains. 3. Reboot the MP Router for the new domains to take effect. **Example:** fcrxlateconfig 10 20 30 Where 10 represents the edge fabric ID, 20 is Remote fabric ID and 30 is the preferred xlate domain ID. Use the `help` command for more details on the `fcrxlateconfig` command.
Password length is limited to 8 characters.	For XPath OS 7.4.x, the maximum password length is 8 characters.
FTP servers	XPath OS supports downloading firmware from any FTP server that is RFC FTP compliant. Limited testing has been completed against the following FTP servers: • HP-UX • RedHat Linux 8.0 built-in FTP service (`vsftpd`) • Microsoft Windows™ Server 2000 FTP service (as part of Microsoft internet services) • NetBSD built-in FTP service • Sun Solaris 8 built-in FTP service

Issue	Description
GNU telnet client	GNU telnet client sessions on certain workstations (for example, Sun Solaris) will be disconnected from XPath OS upon pressing **Ctrl-C** twice in succession. This is in contrast to B-Series Fabric OS, on which the same telnet client and the same key sequence does not cause a session disconnect. GNU telnet clients used with the UNIX® tee utility might be disconnected unexpectedly as well. **Workaround**: Use `/usr/bin/telnet` instead of `/usr/gnu/bin/telnet`.
Root reboot command vs. admin user reboot command	Users should never reboot the system from the root account using the reboot command, or data might be lost. To safely reboot the system, log in as root and change to admin by entering admin at the root prompt. When you are at the admin shell, execute the reboot command.
FA zoning	A private host attached to a Fabric OS switch might not be able to discover FA targets on a MP Router due to the length of the host's HBA PLOGI retry timeout. You can reduce the timeout value to resolve this issue.
FA and QuickLoop zone management	While zone merges with Fabric OS zones containing Fabric Assist mode and QuickLoop zones are supported when the MP Router is used for the FCIP services, users of the MP Router are not expected to manage such zones from the Router. It is not possible to manage such zones from Advanced Web Tools. FA and QL zones can be managed in the CLI of the MP Router, or in the CLI, Advanced Web Tools, or supported management applications of Fabric OS-based switches.
Fibre Channel Layer 2 fabric parameter management	It is not possible to manage the following fabric parameters from Advanced Web Tools: • RA_TOV • ED_TOV • RSCN_Mode These parameters can be managed from the CLI.
NVRAM-related cleanup	XPath 7.3.0b or later explicitly checks for NVRAM corruption that might have occurred during use of earlier XPath releases. It also provides a utility for cleaning the corruption. If you do not run the utility, failures might occur due to XPath OS detection of corrupt NVRAM. The utility runs during installation when `firmwareDownload` is used as the installation mechanism. If `firmwareDownload` is used to upgrade the recovery kernel and install XPath OS, there should be no impact—NVRAM will be silently cleaned. If other installation mechanisms are used, or if the new recovery kernel is not installed, then the NVRAM might remain corrupt, leading to failures, unless you explicitly clean the NVRAM using the following mechanism. Because XPath 7.3.0b or later is more insistent on good NVRAM content, these failures will occur more often in these versions than in previous versions of XPath OS. NVRAM cleanup has been integrated into the latest version of the recovery kernel. If you use `firmwareDownload` from the latest `xpath_rk` package, the recovery kernel will be updated, any NVRAM corruption will be resolved, and the latest XPath OS will be installed in a single step. If you are unable to use firmwareDownload to install the recovery kernel package, follow the product manual instructions to install the XPath Recover RPG through PMON. After you have booted into the recovery kernel, enter the shell by entering **shell** at the rash prompt. Run the nvclean utility and answer **yes** when it prompts you. This will rectify any NVRAM corruption that might exist. Reboot the switch after the cleanup and reset the cfgbank value to its previous entry to boot into XPath OS.
Bundled licenses	The HP StorageWorks MP Router with XPath OS 7.4.0 includes licenses for the following features: • Advanced Web Tools • Advanced Zoning • FCIP Tunneling • FC-FC Routing Different models of the MP Router ship with either 8 or 16 ports enabled. If you require an upgrade from 8 to 16 ports, contact your sales representative.

Issue	Description
SFP media support	The MP Router supports only qualified SFP media. A list of the qualified SFPs is available by running the `sfpSupport` command.
Duplicate domain IDs	When manually setting domain IDs, avoid duplicates. Under Fabric OS, when duplicate domain IDs are detected, fabrics are segmented. XPath OS handles duplicate domain IDs differently, resulting in repeated failed attempts to merge fabrics. This note does not apply to Fibre Channel Routing Services EX_Ports. Manually assigned but duplicate EX_Port domain IDs are correctly detected.
Fabric OS Web Tools 4.1.1 compatibility	Fabric OS Web Tools 4.1.1 does not recognize the MP Router. Manage the MP Router using Advanced Web Tools.
Fabric OS Web Tools vs. XPath OS Web Tools	The Fabric OS implementation of Web Tools is different from the XPath OS implementation of Web Tools. The Fabric OS Web Tools application runs entirely on the Fabric OS switch while presenting an HTML interface to the client browser. XPath OS Web Tools is implemented with Java™ objects running as plug-ins on the client browser. When a user is observing switch events on an XPath OS switch in a different time zone, the events will show up in the local client's time zone, Fabric OS keeps the event time base in the *switch's* time zone. This is a design implementation change that will be updated in upcoming releases of XPath OS.
Zoning through Advanced Web Tools	Perform zoning only from the Fibre Channel switch running the latest version of firmware if fabric contains only Fibre Channel switches or Fibre Channel switches and MP Routers (router backbone fabric). Zoning can be done from the MP Router in a backbone fabric that only contains an MP Router. If zoning is done from the MP Router in a mixed fabric, where chassis-based systems (Directors) are present, user will not see the correct slots and ports for selection.
Security	Updates to Xpath OS 7.3.0 included openSSH version 3.8.1 to minimize security vulnerabilities of fabrics. The MP Router implementation of SSH has been modified to restrict use of SSH v1. SSH v1 may no longer be used to connect to the MP Router, but SSH v2 can be used instead.

Table 10 Limitations

Issue	Description
API support	Users of this release are strongly encouraged to: • Manage the MP Router's functions using the MP Router's CLI and Advanced Web Tools. • Create LSANs in edge fabrics using any tools that can manage zoning. XPath OS 7.1.2c or later generally supports Fabric Access API-based applications such as Fabric Manager and OVSAM. However, note the following: • Testing of API-based applications has not been completed. Check with the management application vendor for AP support status. • Existing versions of Fabric Manager and other API-based applications that manage zoning in edge fabrics can be used to configure LSAN zones that create logical storage area networks by using the MP Router. • API-based applications must be compiled with new API libraries to control directly– supported MP Router functions. Those libraries will be available at a later date. • A FAL-based application connected to a Fabric OS v2.6 switch will not properly interpret the presence of virtual switches and domains created in routed fabrics.

Issue	Description
Fibre Channel Class	XPath OS supports only Fibre Channel Class 3. Testing has shown that Class 2 devices attached to and supported by Fabric OS-based platforms communicate properly through FC-FC routing services on XPath OS 7.30b and are supported. N[L]_Port devices that are connected directly to the MP Router and cannot automatically or manually accept the F_Port's request for Fibre Channel Class 3 are affected. The IBM AIX operating system configured with the IBM 6228 HBA is known not to be able to accept Class 3 and therefore cannot register with the XPath OS Fibre Channel Name Server.
Fibre Channel Management Server in-band support	XPath OS 7.4.0 does not support Management Server requests from hosts connected to the switch. Login requests to the Management Server will be rejected.
Name Server and Zone Server database sizes	The Name Server and Zone Server databases support fabrics within (and actually far larger than) the scalability guidelines. Fabric and zone merge attempts with fabrics beyond the scalability limits presented in this document will prevent fabrics from merging. Fibre Channel Routing Services does not participate directly with Name Server and Zone Server databases on edge fabrics; rather, it consumes zones that begin with the string LSAN_ only and creates Name Server entries in edge fabrics for shared devices only.
Fibre Channel Management Server platform services compatibility	XPath OS 7.4.0 is not compatible with the Fabric OS implementation of the Fibre Channel Management Server platform services. If platform services are enabled on a Fabric OS fabric and a merge is attempted with an XPath OS 7.4.0 fabric, the E_Port links between the fabrics will link and segment at intervals; in effect, the fabrics will not merge. The command `msPlMgmtDeactivate` should be executed on all Fabric OS switches prior to any merge attempts with XPath OS.
Fabric OS open E_Port is not supported	Fabric OS open E_Port is not supported on XPath OS.
Traffic switching	In a single MP Router, you can configure a port to be FC, FCR, GbE iSCSI, or GbE FCIP. Traffic switching is supported only between the following types of ports: • FC & FCR • FC & GbE FCIP • FC & GbE iSCSI • FCR & FCIP Traffic switching between other types of port combinations is not supported. This applies to port combinations on the same platform as well as across independent platforms. For example, traffic from an iSCSI initiator connected to a MP Router cannot be switched by an EX_Port on the same or independent router.

Table 11 Fabric Manager

Issue	Description
Disabled EX_Port	If an EX_Port is disabled due to a Fabric ID conflict, the reason (Fabric ID conflict) is not displayed in the "Type" column of the Ports Table within Fabric Manager.
Front and Xlate Domains	The Front and Xlate Domains are listed in the "Selected Fabric" tree of the FCS tab within the Secure Policy Editor in Fabric Manager. These domains should not be listed. If these domains are selected and added to the FCS list, an error message is received.

XPath OS migration procedures

The XPath OS migration procedures are described in the *HP StorageWorks XPath OS administrator guide*. Refer to this guide for explicit instructions on upgrading or downgrading your XPath OS.

Table 12 lists the XPath OS file and its associated recovery kernel file for each firmware version.

Table 12 XPath OS file and recovery version

XPath OS File	Recovery Kernel (rk) File
xpath_os_v7.3.0	xpath_rk_1.4.1
xpath_os_v7.4.0	xpath_rk_1.5.2
xpath_os_v7.4.1	xpath_rk_1.5.2
xpath_os_v7.4.1b	xpath_rk_v1.5.2
xpath_os_v7.4.1c	xpath_rk_v1.5.2
xpath_os_v7.4.1d	xpath_rk_v1.5.2

Table 13 lists recovery kernel (rk) files for downgrade procedure

Table 13 rk files for XPath OS downgrade

XPath OS File	Recovery Kernel (rk) File
xpath_os_v7.1.X	xpath_rk_1.4.1.3
xpath_os_v7.3.X	xpath_rk_1.4.1
xpath_os_v7.4.0	xpath_rk_1.5.2.9

Compatibility/interoperability

Fibre Channel standards

Standards compliance

For detailed information about Fibre Channel standards, visit the following web site: http://www.t11.org.

XPath OS 7.4.1c conforms to the following Fibre Channel standards in a manner consistent with accepted engineering practices and procedures. In certain cases, additional proprietary supplemental functions may be added to those specified in the standards.

- FC-FLA NCIT S TR-20: 1998
- FC-FG ANSI X3.289: 1996
- FC-FS Rev 1.7
- FC-PH ANSI X3.230: 1994
- FC-PH-2 ANSI X3.297: 1997
- FC-PH-3 ANSI X3.303: 1998
- FC-SW-2 Rev 4.9
- FC-MI Rev 1.92
- FCP-2